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Posttraumatic Stress and Behavior Problems in Infants and Toddlers With Burns

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This study assessed posttraumatic stress disorder (PTSD) and behavior problems in young children with burns and examined individual, injury-related, and family-related determinants. Seventy-six children, aged 12–49 months, were assessed at an average of 15 months after their burn injury, using parents as informants on the posttraumatic stress disorder semi-structured interview and observational record for infants and young children and the child behavior checklist. Ten children (13.2%) met the alternative criteria for PTSD proposed by Scheeringa et al. Number of PTSD symptoms were associated with family-related variables (maternal PTSD, quality of family relations). Compared to community norms, children with burns showed less externalizing behavior problems, and internalizing behavior problems were within the normal range. Overall, behavioral adjustment was associated with the quality of family relations (cohesion, expressiveness, conflicts). Whereas behavior was found to be normal in young children with burns, this study provides evidence for a substantial prevalence of PTSD.

Key words posttraumatic stress; burns; children.

Introduction

There is now clear evidence that trauma affects young children in a way similar to the way it affects older children and adults (Scheeringa, 2008). However, diagnosing posttraumatic stress disorder (PTSD) in young children using DSM-IV diagnostic criteria and algorithms (American Psychiatric Association, 2000) is difficult, since the criteria rely explicitly on verbalizations of subjective experiences. Furthermore, posttraumatic stress symptoms in young children may differ in their clinical manifestation from those in older children and adults (Scheeringa, 2004). Sound measures that include behaviorally anchored and developmentally sensitive alternative criteria for diagnosing PTSD in preschoolers have been developed recently (Scheeringa, Peebles, Cook, & Zeanah, 2001; Scheeringa & Zeanah, 2005; Scheeringa, Zeanah, Myers, & Putnam, 2003). Therefore, studies examining posttraumatic stress in infants and toddlers after different traumatic events, such as road traffic accidents and gas explosion and burn injuries, have emerged only just recently (Drake et al., 2006; Meiser-Stedman, Smith, Glucksman, Yule, & Dalgleish, 2008; Ohmi et al., 2002; Stoddard et al., 2006).

A severe burn injury is one of the most traumatic injuries experienced by children (Saxe et al., 2005). Traumatic aspects include not only the injury event but also the difficult period of treatment and hospitalization involving painful and frightening experiences. Despite the fact that infants and toddlers account for about 50% of all pediatric burn injuries (Schiestl, Beynon, & Balmer, 2006), very few studies on psychosocial outcome have included preschoolers. Recently, a U.S. research group (Stoddard et al., 2006) started to focus on the short-term impact of serious burn injuries in preschoolers and to assess the occurrence of acute stress symptoms using the posttraumatic stress disorder semi-structured interview and observational record for infants and young children (PTSDSSI).

Almost 30% of these young children exhibited acute stress symptoms within 1 month after the burn incident. Factors contributing to the development of acute stress symptoms were indicators of trauma severity and parents' PTSD symptomatology (Drake et al., 2006; Stoddard et al., 2006). Further, the positive effect of morphine on decreasing the number of PTSD symptoms in young children with burns supports the traumatizing effect of pain experiences (Stoddard et al., 2009). Along with these studies on acute stress symptoms, there are two studies that examined behavior problems in preschoolers after burn injuries using the Child Behavior Checklist (CBCL). The first, a study by Meyer, Robert, Murphy, and Blakeney (2000) of 33 children aged 2–3 years, revealed that young burn survivors with a mean burn size of 50% exhibited significantly more internalizing behavior problems than children from a community sample. In contrast, results from a controlled, prospective study in 40 burn survivors aged 4 years and younger (mean burn size: 8.5%) found normal behavior (Kent, King, & Cochrane, 2000).

In summary, although there are now some initial insights into acute stress symptomatology and behavior problems of young children with burns, this is certainly not true for long-term PTSD. Specifically, the frequency rate of PTSD in this age group is still unknown. Also, factors predicting PTSD and behavior problems in the long-term after a burn injury have not yet been examined. The present study had two objectives: First, we aimed to assess the frequency of PTSD according to the DSM-IV and the alternative criteria (Scheeringa et al., 2003) for young children and to assess the presence of behavior problems in a small community-based sample of preschoolers with burns. Due to the greater age sensitivity of the alternative diagnostic algorithm, we hypothesized higher rates of PTSD according to the alternative algorithm compared to the DSM-IV algorithm. Based on previous findings in preschoolers with similar burn sizes (Kent et al., 2000) and school-age children (Landolt, Grubenmann, & Meuli, 2002), we expected behavior problems in our sample to be within normal ranges as compared to published community norms. Second, we aimed to examine the association of individual, injury-, and family-related characteristics with the total number of PTSD symptoms and behavior problems. Following the few existing studies on acute stress in preschoolers with burns, we expected to find a substantial influence of injury-related variables on the child's psychological outcome. Investigations on posttraumatic adaptation in early childhood emphasized the importance of the parent-child relationship in modulating the effects of a traumatic event (Scheeringa, 2001). This was recently confirmed for preschoolers with burn injuries during the treatment phase (Saxe et al., 2006). In this context and on the basis of previous findings in school-age children with burns (Landolt, Grubenmann et al., 2002), we expected to find a substantial influence of family-related characteristics such as parental well-being and family environment characteristics.

Methods

Procedure

The study was approved by the institutional review board. Parents of young children aged 9–48 months were eligible for the study if the following criteria were met: (a) hospitalization of at least one night for a burn injury at the largest Swiss Pediatric Burn Center of University Children's Hospital Zurich; (b) at least 3 months postburn in order to avoid interference by medical problems (e.g., pain, surgery); (c) child living at home for at least 1 month after discharge from hospital in order to avoid the assessment of acute posthospital adjustment problems; (d) no previous evidence of mental retardation; and (e) parental command of the German language. A total of 101 eligible parents were invited by letter to participate in the study. Of these, 25 parents refused to participate. The final sample comprised 76 participants (response rate 77%). There were no significant differences between participants and nonparticipants with regard to child age at injury (Mann–Whitney $U = 855.50$, $p = .46$), time lapse postburn (Mann–Whitney $U = 729.50$, $p = .08$), burned total body surface area (Mann–Whitney $U = 729.50$, $p = .23$), and length of hospital stay (Mann–Whitney $U = 822.00$, $p = .31$). After we received parents' written informed consent, we contacted them by telephone and scheduled a face-to-face interview for the 76 mothers to assess PTSD symptoms of their children. Most interviews were conducted at the child's home. Additionally, mothers answered separate questionnaires on their child's behavior problems, on family characteristics, and on their own PTSD symptoms. Fathers answered separate questionnaires on their own PTSD symptoms. Both parents were requested to return their questionnaires within 2 weeks after the interview. Sixty-one mothers and 54 fathers returned the questionnaires within the requested time or shortly after being reminded. Demographic and injury-related variables were retrieved from the patient's medical record.

Sample Characteristics

Seventy-six children (44 boys, 32 girls) with a mean age of 32.0 months ($SD = 9.5$; range 12–49) participated in the study. Socioeconomic status (SES) of the families was

as follows: 8 lower SES (11.4%), 41 middle SES (58.6%), 21 upper SES (30%). In six cases, SES was unknown. In 41 children (56.2%) both parents were Swiss; 32 (43.8%) had a background of foreign nationality [either one parent was Swiss and the other a foreign national (13 children, 17.8%) or both parents were foreign nationals (19 children, 26%)]; in three cases nationality was unknown. Mean age at burn injury was 16.5 months (median = 15, *SD* = 9.8; range 0–44). Burns were most frequently the result of scalds (90.8%). Average time lapse postburn was 14.8 months (*SD* = 9.2; range 3–48). Mean burn size was 7.6% (*SD* = 7.4, median = 5.5%: range 1–50%). Thirty percent of the participants had at least one skin grafting procedure. Twenty-nine percent of the children needed dressing changes under general anesthesia during hospitalization (mean number of dressing changes = 3.1; *SD* = 2.5, median = 1.5; range 1–13). The average length of hospital stay was 14.5 days (*SD* = 20.1, median = 7, range 1–126).

Measures

Child Posttraumatic Stress Symptoms

PTSD symptoms were assessed using the German translation (Irblich, 2006) of the PTSDSSI (Scheeringa & Zeanah, 2005). Translation of the instrument was performed according to international guidelines (Mallinckrodt & Wang, 2004), including independent back-translation and authorization by the original authors of the scale. The PTSDSSI is an examiner-based interview that is conducted with the child's primary caregiver; it is based on the studies by Scheeringa et al. (Scheeringa, Zeanah, Drell, & Larrieu, 1995; Scheeringa et al., 2001, 2003). It contains all of the DSM-IV PTSD items as well as modified wordings for five PTSD symptoms (recollections, flashbacks, diminished interests, detachment, and irritability) to make them more developmentally sensitive for children aged 9 months to 6 years. As an example of this modification for preschool children, item one of criterion B (recollection) contains an additional note that intrusive recollections in young children do not necessarily appear distressing and that in young children repetitive play may occur in which themes or aspects of the trauma are expressed. The coding of parents' answers into PTSD symptoms was conducted according to the coding manual by Scheeringa & Zeanah (2005). The PTSDSSI allows for a diagnosis either by the DSM-IV algorithm or by the empirically validated alternative algorithm for young children. The latter does not require criterion A2 (the child's reaction at the time of the event). Only one of three items is needed to meet the avoidance/numbing criterion. Symptoms must have been present for at least 1 month and cause impairment in at least one significant life area. The total number of PTSD symptoms can be determined by summing up all symptoms present. In order to clarify the picture of the PTSD symptoms displayed by the children in this study, the content of each symptom affirmed by caregivers during the interview was coded into injury-, treatment-related, or mixed/unspecific and then summed up for the two clusters of avoidance/numbing and intrusion. Good interrater reliability and validity of this measure were confirmed in several studies (Scheeringa et al., 2001, 2003; Scheeringa, Zeanah, Myers, & Putnam, 2005). In this study, the sum score of total number of PTSD symptoms had an internal consistency of Cronbach's $\alpha = .65$.

Child Behavior Problems

The *Child Behavior Checklist 1.5–5* (CBCL/1.5–5) (Achenbach & Rescorla, 2000) is a 100-item standardized parent-report measure of behavior and emotional problems in children. Higher scores indicate a greater number and intensity of behavior and emotional problems. In this study, the German version was used (Arbeitsgruppe Deutsche Child Behavior Checklist, 2002), and only parents of children older than age 18 months were asked to fill in the questionnaire. Reference *T*-scored values are provided by a community sample of 700 healthy U.S. children aged 18–71 months. To date, no Swiss norms for the CBCL/1.5–5 are available. A cutoff *T*-score of 65 was used to indicate behavior problems in the borderline/clinical range (Achenbach & Rescorla, 2000). The CBCL was previously shown to have excellent reliability and validity (Achenbach & Rescorla, 2000). Internal consistency coefficients in this study are reported in Table II and were similar to those of the reference study.

Parents' Posttraumatic Stress Symptoms

PTSD symptoms of mothers and fathers were assessed using the *Posttraumatic Diagnostic Scale* (PDS) (Foa, Cashman, Jaycox, & Perry, 1997). The scale is widely used for screening and assessing PTSD in clinical and research settings, and it demonstrated excellent psychometric properties in its original English version (Foa et al., 1997). This study used the German version of the PDS (Steil & Ehlers, 2000), which demonstrated similar psychometric properties to the original English-language scale. In our sample, internal consistency of the PDS total score was $\alpha = .77$ for fathers and $\alpha = .83$ for mothers.

Family Relations

Quality of family relations was measured using the German version (Schneewind, Beckmann, & Hecht-Jackl, 1985) of the *Family Relationship Index* (FRI) (Moos & Moos, 1994). The 27-item questionnaire consists of three subscales of

the Family Environment Scale, assessing cohesion, expressiveness, and conflict. The FRI overall index is calculated by summing the three subscales, whereby items of the conflict scale are reversely scored. Higher scores indicate better family relationships. Reliability and validity of this scale were confirmed in previous studies (Moos & Moos, 1994). Internal consistency of the overall index was $\alpha = .69$.

Socioeconomic Status

SES was calculated by means of a 6-point scale of both paternal occupation and maternal education (range 2–12). Specific examples of educational and occupational levels were defined in a previous study at University Children's Hospital (Largo, Molinari, Comenale, Weber, & Duc, 1989). Maternal education was used, because in Switzerland mothers of young children often resign from their jobs and stay at home with their children. Three socioeconomic classes were defined as follows: scores 2–5 as lower SES; scores 6–8 as middle SES; scores 9–12 as upper SES. This measure was shown to yield a reliable and valid indicator of SES in the Swiss community (Landolt, Vollrath, & Ribi, 2002).

Preceding Life Events

The occurrence of 12 significant life events such as divorce, unemployment, or severe illness in the family was assessed from mothers for the 12 months preceding the burn injury (Landolt & Vollrath, 1998). A life event score for each family was computed by counting the number of life events reported.

Trauma Severity Score

A trauma severity score similar to the one used by Drake et al. (2006) was computed by grouping the variables ''burn size,'' ''number of dressing changes,'' and ''length of hospital stay'' into three equal categories. The child's burn size was categorized as small (1 = 1–3%), medium (2 = 4–7%), or large (3 = above 7%). Dressing changes were categorized as low frequency (1 = 1 dressing change), medium frequency (2 = 2–3 dressing changes), or high frequency (3 = more than 3 dressing changes). Length of hospital stay was categorized as short (1 = 1–5 days), medium (2 = 6–11 days), or long (3 = more than 11 days). The average trauma severity score for each child was computed by summing up the scores and dividing the sum by three. Internal consistency of the trauma severity score was $\alpha = .70$.

Statistical Analysis

Data were analyzed using SPSS statistical software for Windows, release 16.0 (SPSS Inc., Chicago, Illinois). Analyses were performed with two-sided tests, with $p < .05$ considered significant. Descriptive statistics were used to analyze the frequency of PTSD symptoms and diagnosis. Discrepancy between the two different frequency rates of PTSD was tested by means of χ^2 analysis. Comparison of CBCL *T*-scores with published reference data was determined using one-sample *t*-tests. In addition, effect sizes of group differences (Cohen's *d*) were computed for the CBCL scales. According to the Kolmogorov–Smirnov Goodness of Fit test, some independent variables were not normally distributed. Therefore, associations of the total number of PTSD symptoms and behavior problems with individual, injury-, and family-related characteristics were examined by means of nonparametric Spearman rank correlations. Holm's Sequential Bonferroni Procedure was applied in order to correct for multiple comparisons (Abdi, 2010). Mann–Whitney U-tests were used to determine differences in PTSD symptoms and behavior problems when the independent factors were dichotomized.

Results

PTSD

Of the 76 infants and toddlers in the study, 10 (13.2%) [95% confidence interval (CI) 5.6–20.8] met full criteria for a diagnosis of current PTSD based on the alternative algorithm for young children (Scheeringa & Zeanah, 2005). Notably, only one child (1.3%) (95% CI 1.25–3.9) met the original DSM-IV criteria for a diagnosis of PTSD. Pearson's chi-squared test revealed a significant difference between the frequency of PTSD when diagnosed with the alternative, respectively, DSM-IV algorithm ($\chi^2 = 6.272$, $df = 1$, $p = .01$). Analysis of symptom clusters of PTSD revealed that 73.7% of the 76 children met the alternative criteria for reexperiencing, 64.5% for avoidance and emotional numbing, and 19.7% for increased arousal. Examination of the specific content of PTSD symptoms showed that reexperiencing and avoidance/numbing symptoms were more often treatment related (e.g., distress due to people wearing white clothes, distress when being held or touched in the body area of the injury, avoidance of certain rooms/areas in the hospital, etc.) than related to the injury event (e.g., distress due to the sound of the kettle, distress when someone spills something, avoidance of the place where injury occurred, etc.) (Table I). One-quarter to one-third of the children showed a mixture of both treatment and event-related symptoms in the reexperiencing and the avoidance/numbing symptom cluster. Full diagnosis of parental PTSD occurred in 6.9% ($n = 4$) of the mothers and 6% ($n = 3$) of the fathers.

Behavior Problems

As listed in Table II, mothers reported significantly lower rates of externalizing and total behavior problems in their children compared to community norms. Effect sizes of mean differences were small to medium. Analysis of *T*-scores revealed that only 5.1% of the young children with burns had internalizing and 3.4% had externalizing behavior problems in the borderline/clinical range.

Determinants of PTSD Symptoms and Behavior Problems

Table III shows associations between individual, injury-, and family-related variables with the total number of PTSD symptoms and the CBCL total *T*-score. Individual variables such as child's age at assessment and child's age at time of injury were not related to PTSD and behavior problems. As an injury-related factor, trauma severity was significantly correlated with the child's PTSD symptoms. However, after correction for multiple comparisons, the association was no longer statistically significant. Injury-related factors were not significantly correlated with behavior problems. The importance of family-related variables became apparent in significant associations between the child's PTSD symptoms and both maternal PTSD symptoms and the quality of family relations (i.e., cohesion, expressiveness, and conflicts within the family). These associations remained significant after correction for multiple comparisons. The relation between father's PTSD symptoms and child's outcome did not reach statistical significance.

Table I. *Content of Symptoms in Children With at Least One PTSD Symptom*

Content of PTSD symptoms	Avoidance/numbing symptoms ($n = 49$)	Intrusion symptoms ($n = 56$)
Related to injury event (%)	26.5	19.6
Related to treatment (%)	36.8	41.1
Mixed/unspecific (%)	36.7	39.3

Discussion

This cross-sectional study assessed long-term PTSD symptomatology and behavioral adjustment in preschoolers with burns by employing a developmentally appropriate approach. Further, we examined predictors of children's postburn symptomatology. Although a few previous studies reported acute stress symptoms in this age group, this study is the first to report valid long-term PTSD rates in preschoolers with burns on average 15 months after their injuries. In agreement with our initial hypothesis, the reported frequency rate of 13.2% according to the alternative criteria by Scheeringa et al. significantly exceeds the DSM-IV rate of 1.3%. Regarding the numerous symptoms displayed by the children in our sample, a frequency rate of 13.2% based on the alternative algorithm criteria not only seems more appropriate but also shows more agreement with other studies on injured preschoolers than a DSM-IV

Table III. *Spearman Correlation Coefficients Between the Total Number of PTSD Symptoms, Behavior Problems, and Individual, Injury-Related, and Family-Related Variables*

	Number of PTSD symptoms		CBCL Total behavior problems *T*-score	
	r	p	r	p
Individual variables				
Age at assessment	.13	.282	−.06	.653
Age at burn injury	.15	.211	−.19	.149
Injury-related variables				
Place of burn injury at home	−.12	.302	−.07	.624
Time lapse post-burn	.01	.977	.13	.323
Trauma severity score ($\alpha = .70$)	**.23**	**.048**	−.02	.867
Family-related variables				
SES (sum score)	.11	.397	.01	.929
Preceding life events	.08	.544	.15	.268
Number of PTSD symptoms, mother	**.39**	**.002**[#]	**.29**	**.029**
Number of PTSD symptoms, father	.19	.172	.26	.063
Family relationship index	**−.41**	**.001**[#]	**−.43**	**.001**[#]

Note. [#]significant at the $p < 0.05$ level after Holm-Bonferroni correction.

Table II. *Sample Means and Normative Data for Behavior Problems in Children Older than Age 18 Months (CBCL T-Scores)*

Child behavior checklist (α)	Patients ($n = 59$) Mean (*SD*)	Reference group[a] ($n = 700$) Mean (*SD*)	Effect size *d*	p[b]	Above cut-off (≥ 65) (%)
CBCL total score (.85)	46.86 (9.2)	50 (10)	−.33	.011	3.4
CBCL internalizing score (.77)	47.54 (9.8)	50 (10)	−.25	.060	5.1
CBCL externalizing score (.72)	46.15 (8.6)	50 (10)	−.41	.001	3.4

[a]Community norms (Arbeitsgruppe Deutsche Child Behavior Checklist, 2002).
[b]One-sample *t*-test with community norms.

rate of 1.3% (e.g., Meiser-Stedman et al., 2008). In our study, 73.7% of the 76 infants and toddlers met the alternative reexperiencing criterion, 64.5% met the avoidance/numbing criterion, and 19.7% met the increased arousal criterion. These findings contrast with results from studies using the DSM-IV algorithm, where the avoidance/numbing criterion is usually the least prevalent. The relatively high frequency of avoidance/numbing symptoms in our sample can be attributed to the varying PTSD algorithm threshold. Studies using the alternative diagnostic algorithm for PTSD in infants and toddlers, where only one item instead of three items is mandatory to meet the avoidance/numbing criterion, demonstrate the same order of frequencies (Stoddard et al., 2006).

Besides PTSD, this study assessed behavior problems as another important outcome variable. In contrast to a previous study of young burn survivors (Meyer et al., 2000), mothers in our sample reported significantly fewer externalizing behavior problems and total behavior problems in their children as compared to healthy children. The rate of internalizing behavior problems was within the normal range. However, mean burn size in the study by Meyer et al. (2000) was substantially higher (50%) than in our study of a less severely injured sample (7.6%). Previous studies that included preschoolers with comparable burn size (Kent et al., 2000) and studies on school-age children (Landolt, Grubenmann et al., 2002) reported normal behavior and are therefore in line with our findings on internalizing behavior problems. The absence of behavior problems despite enhanced levels of PTSD symptoms is also known from a study in school-age children (Lengua, Long, Smith, & Meltzoff, 2005). Beyond that, negative and positive psychological sequelae of traumatic experiences can coexist, as demonstrated in a recent study (Alisic, Van der Schoot, Van Ginkel, & Kleber, 2008). However, the findings on significantly fewer externalizing and total behavior problems call for further explanations. One possible clue to this positive behavioral outcome might be the extensive parental care and attention that young children with burns usually receive. Although characteristics of parental care and attention were not directly assessed in this study, the significant association between behavioral adjustment and the quality of family relations as shown in Table III might further underline this assumption. This mechanism possibly reflect the concept of ''posttraumatic growth'' in children and/or in parents, which refers to the experience of positive change as a result of the struggle with a life crisis (Alisic et al., 2008). In this context, children might have shown fewer behavior problems or parents might have perceived them as less striking and disturbing. However, several researchers suggested that excellent psychological adjustment may in fact be a false-positive finding, in that parents form an overly optimistic picture of themselves as a result of defense mechanisms during the adjustment process (Abdullah et al., 1994). Finally, results might have been more specific if we had used a structured psychiatric interview such as the Preschool Age Psychiatric Assessment (PAPA) (Egger & Angold, 2004) instead of a checklist measure identifying only broad domains of problems. The findings thus need to be explored further in future studies.

We also aimed at examining various correlates of PTSD and behavior problems. After correction for multiple comparisons we found no significant associations between injury-related variables and the child's PTSD symptoms and behavior problems. In this regard, our findings contradict our initial hypothesis and differ from the results of earlier studies on acute stress in preschool children with burns (Drake et al., 2006; Stoddard et al., 2006). However, those earlier studies assessed acute stress symptoms within the first month after admission to the hospital. It can be assumed that in this acute phase injury-related factors are more important compared to the long-term phase that we examined in our study. Furthermore, a path analyses model in the study by Stoddard et al. (2006) revealed only an indirect influence of injury-related variables on the child's acute stress symptoms. Notably, uncorrected bivariate correlations in our study revealed a significant relation between trauma severity and the number of child's PTSD symptoms. Considering the variables that were included in our trauma severity score, it is conceivable that injury-related variables could indeed have a traumatizing effect on young children. The mainly treatment-related content of the child PTSD symptoms in our study also support this hypothesis. As a result of their developmental stage, it might be more difficult for infants and toddlers to understand the necessity for painful medical procedures and the temporary separation from caregivers. For example, clinical experience shows that young children may interpret burn dressing changes as an act of aggression. Young children's limited understanding may, therefore, exacerbate the subjective feelings of fear, horror, and helplessness that render an event traumatic. Finally, the lack of a significant association between time lapse postburn and the development of PTSD is in line with findings of a previous study (Scheeringa et al., 2005) and possibly indicates the risk of an unremitting course of PTSD in young children with burns.

The influence of family-related variables becomes apparent in significant associations between child's outcome and mothers' own PTSD as well as the quality of family relations. Furthermore, behavior problems were

significantly related to the quality of family relations. To date, the importance of family-related variables for psychological adjustment has never been reported for this age group. However, similar results were found in older children (Landolt, Grubenmann et al., 2002). Furthermore, our findings about the possible protective influence of maternal well-being and good family relations on the development of child's PTSD and behavior problems are in line with previous findings in preschool children with traumatizing experiences (Scheeringa et al., 2001; Stoddard et al., 2006). However, in our study reported child adjustment, mother's PTSD symptoms, and quality of family relations were assessed by the same person. Therefore, it is possible that these reports are related (shared variance). The lack of significant association between father's and child's PTSD symptoms could affirm this association. Another possible clue to this lacking effect of paternal PTSD might be the fact, that in this age group of young children, usually mothers are mainly responsible for the child's care and therefore might have been more often present during the child's hospitalization than fathers. Furthermore, it cannot be excluded that nonparticipating fathers ($n = 22$) might have differed from participating fathers concerning their PTSD symptoms. However, participation of fathers was not significantly related to the child's PTSD (Mann–Whitney $U = 580.00$, $p = .87$) and behavior problems (Mann–Whitney $U = 132.00$, $p = .25$).

The strengths of this study include the relatively large sample, the standardized clinical assessment, the high rate of participation (77%), and the inclusion of fathers. Nonetheless, some limitations merit note. First, the results of this study are relevant to hospitalized young children with burns of small to moderate sizes. Due to the cross-sectional design, interpretation of causal relations between outcome and predictor variables requires caution. Second, data based on parental questioning provide only select information. Since the child's symptoms were rated by mothers, a possible influence of maternal distress on the perception and rating of their child's symptoms must be considered. However, in our sample, only 6% of mothers met criteria for a PTSD diagnosis themselves. Moreover, maternal ratings of their children's behavioral adjustment were very positive and revealed only few problems. Third, due to the lack of Swiss norms, we used U.S. norms to interpret the behavior of Swiss preschoolers. The appropriateness of U.S. norms for our sample can be questioned. However, previous studies on the CBCL for preschoolers support the use of the U.S. norms for German samples (Elting, 2003) and its cross-cultural validity (Koot, Van Den Oord, Verhulst, & Boomsma, 1997). Therefore, we believe that the use of U.S. norms for our sample is appropriate. Finally, although we assessed several individual and injury-related determinants of PTSD and behavior problems, other possibly important variables, such as pretraumatic psychopathology and health status, were not considered.

Several implications for the clinical care of young children with burns can be drawn from this study. First, our findings add to the recently emerging evidence that even very young children develop long-lasting symptoms of PTSD after traumatic experiences such as injury events and invasive medical procedures. Second, the assessment of specific PTSD symptoms is especially relevant in young children after traumatic events, since common instruments such as the CBCL seem to underestimate young children's posttraumatic stress reactions. Third, the results of this study lead us to believe that family-related characteristics may play an important role in the development of PTSD symptoms in young children. Therefore, interventions that target the parents' own distress as well as the family system are needed to reduce posttraumatic stress morbidity in young children with burn injuries.

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